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Abstract

The claim is frequently made that, as cities become loaded up with information and communications technology and a resultant profusion of data, so they are becoming sentient. But what might this mean? This paper offers some insights into this claim by, first of all, reworking the notion of the social as a spatial complex of 'outstincts'. That makes it possible, secondly, to reconsider what a city which is aware of itself might look like, both by examining what kinds of technological practices are becoming commonplace and by considering the particular case of spatial awareness. In turn, this leads to a third rumination on how cities might become aware as different kinds of sprite, channelling outstincts in spatially variable ways. Whatever the case, it is clear that new technical-artistic interventions are required if these sprites are not to become simply servants of the security–entertainment complex. Some of these interventions are examined in the fourth part of the paper.

Keywords

City, sentience, outstinct, ontograph, Big Data, surface

Introduction: Sociality, outstinct and space

The idea of sociality concerns the quality of being 'social' and it has been at the root of what we understand as a 'social' science. It usually involves both the activity and practices of being sociable and the tendency that human beings have to form social groupings, variously called communities, societies, bands, and the like. Periodically, commentators make a claim that the form of sociality is changing. For example, Wittel (2001: 51–52), like a number of other contemporary commentators, has argued that we are moving into a period of network sociality which 'is a form of sociality that is ephemeral but intense, . . . is informational and technological, . . . combines work and play, . . . is disembedded and generic, and . . . emerges in the context of individualization'. But in recent years, sociality has not just been historically redefined like this but has come under attack as a concept.

The charge has been led from two separate directions. One is from a group of researchers who want to rethink the concept entirely. For example, Latour (2005) wants to jettison the whole Durkheimian approach which seems to him to both fetishize social bonds and to ignore the fact the 'the social' is always mediated by things: there can be no 'pure' social bond. In other words, he wants to work towards new descriptions of existence, new instructions for assembling types and relations, new compendiums which record how things are juxtaposed, new 'ontographs' (Bogost, 2012) – a term I will return to.

The second direction comes from the work of primatologists, work which is looking at the roots of cooperation: the best that can be said is that there are now a lot of different accounts of how and why sociality has come into being – including, to name but a few, practices of cooking (Wrangham, 2009), the power of language (Pinker, 2011), the unique length of human

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childhood and the consequent need for maternal child-rearing (Hrdy, 2009), and the increased predation risk associated with diurnal activity (Shulz et al., 2011). This work does not so much attack notions of sociality as question its origins and in that questioning it has broadened the orbit of what counts as sociality away from simply the kind of situational empathy occasioned by cooperation (Tomasello, 2010), painting sociality on a much broader canvas.

Yet, ironically, and at exactly the same time as these critiques of the term and its content are being mounted, a strong notion of sociality is being inserted into the interstices of everyday life by means of information and communications technology and especially through the practices of 'pervasive sociality', practices which aim to make sociality into something that is always and everywhere augmented by information and communications technology so that, for example, no social event has ever to be laid aside or forgotten (Dodge and Kitchin, 2007). 'Sousveillance' sits alongside conventional surveillance, producing a technical substrate to sociality which is based on knowledges of 'the social' which it embeds, tracks, and simultaneously promotes, often through active participation. Drawing on often very simple notions of what sociality is which are boosted by the tendency of developments in information and communications technology to concentrate on the visible and measurable (Harper, 2012), a background is being produced which is both reductive and, at exactly the same time, formative.

This paper is an attempt to intervene in these developments – in which a critique of human sociality sits within a period in which human sociality has become more and more explicitly acknowledged and engineered as a given reality – by rethinking sociality as a *spatial* complex of uneven and constantly evolving human *and* nonhuman forces based on the rise of an urban field which, like water soaking into blotting paper, is gradually congealing to produce a new kind of canopy. To attempt this redescription, I will call first on what might be understood as a base notion of sociality, namely the notion of 'instinct', understood as a geography of call and response which can take in actors of many kinds. That may seem to some to be an odd starting point. After all, instinct often calls up untoward resonances of mechanism and determinism which might seem to be at odds with some of the rather more fluid qualities of space which involve movement, fracture and becoming.

But I want to work with this tension by revisiting the contemporary city. In framing the world as call and response – a world in which a response is often a call – I want to consider the process by which both are constructed and made into replicable practices of what might be called not so much the unified agency of instincts as the disunified agency of '*outstincts*' in that they naturally include 'mediation' – it is far more than that – through and by objects loaded with information and communications technology, thus allowing cities their own forces of energy, tenacity and magnetism.

In making this move to take in objects and in thus moving away from exclusively human notions of sociality, I want to show an allegiance to three interlocking theoretical commitments which, taken together, start to describe outstinct. The first is to the idea that the human world contains a vast hinterland of 'dark matter' or 'plasma' that we do not understand and of which we often only feel as echoes and intimations which we cannot scry. In other words, all kinds of forces and pressures can exist 'not yet covered, surveyed, mobilized, or subjectified' (Latour, 2005: 244) whereof we know very little at all, can only half-discern a shape, slip in between our networks, or, perhaps worst of all, are simply unintelligible, existing without us and without need of us. So far as our understanding of social life is concerned, we may still be in the dark ages, in that the triggering of large amounts of that life and vitality relies on unaccounted-for elements, what Latour (2005: 245) calls the 'missing masses'. Alternatively, to put it another way, we might think of the situation as one in which our time frames are so attenuated that we cannot sense many of the processes we are involved in, except as momentary, unexplained interruptions. Rather like various kinds of animals or plants, our perceptions of time and space are skewed in particular directions and although we have instruments that now allow us to see at least some other registers, we cannot produce an instant compass. Or, again, we can see the situation as one in which commands seem to arise without being able to be sheeted home to any identifiable agency: they produce affects like dread and foreboding which are consequential atmospheres but seem to have no definable origin and no obvious boundaries (Fuller and Goffey, 2013; Ngai, 2012). There is evaluation without a clear object of attention, in a time when an ever more sensuous relationship to objects seems to be becoming the norm.

The second commitment follows on, and that is to the idea of emergence. Whilst that means that I am certainly not against the idea of a social group which is more than the sum of its parts (Tuomela, 2007), I want to see the process of emergence as ranging outside what we conventionally understand as 'the social' in that I do not see that it is possible or necessary to see the vagaries of human interaction purely in terms of human being. That move gives access to a world which is not the expression of a single species and cannot be thought of in terms of subjectivism and decisionism.[1] In particular, not trying to tell the story in that way allows us to think about conglomerations of

all kinds of entities – like cities – as forces in their own right, with their own means of composition. Thus, when Peter Ackroyd argues that 'London has become part of the natural world', I want to take this statement at face value, rather than seeing it as simply having metaphorical content. I want to see cities like London as increasingly having their own forms of energy, tenacity and magnetism built out of forces of outstinct.

The third commitment is to what Guattari (2011, 2013) called 'objective subjectivity', and to the individual as a bearer of all kinds of partial subjectivities which are bundled together, broken asunder and shuffled hither and thither by all manner of assemblages, and thus are constantly mixed in with all manner of objects such that the divides between subject and object (and inner and outer) are perennially not just confused by this collectivity of heterogeneous components but perennially shifting. This is a kind of spirit world, if you like, a 'heteroverse' (Bryant, 2011) of 'magical' thought in which all manner of jumbled human and nonhuman forces constantly assemble, hunt and capture attention and haunt social interaction. It allows us to talk seriously about poetical and magical symbolism, especially in an age when mental states, including emotions, concepts and sense configurations, can be transmitted directly at a distance through advances in information and communications technology and the visual representations arising out of them (Berardi, 2011).[2] These are operators which 'precisely have a function of crossing times and spaces, insides and outsides, and the subjects and objects of the capitalistic universe' (Guattari, 2011: 105), manufacturing very particular times and spaces, not time and space in general.

Thus, outstincts might be thought of as affective forces which are composed by bringing bodies and things into conjunction in a relationship of adjacency. Rather like atmospheric dynamics, they can form long-lasting currents of influence but equally they are able to form eddies and vortices which produce local equilibria. Whatever the case, it is very rare that we can observe all of the points of adjacency of an outstinct since each of these three features produces its own kind of obscurity which manifests as disconnectedness and its own kind of direction which rarely adds up to just 'our own': hence the saying 'things go awry'. Even in a time when humanity has become a collective force able to change the planet what it has wrought is often beyond its comprehension because the forces of outstinct are continuously changing the stage upon which human actors operate (Latour, 2011). Composition and decomposition co-exist as a part of the same force, which is what makes it so difficult to name.

What has become clear is that the kinds of 'outstinctive' forces that I want to begin to describe and represent are starting to reveal themselves more clearly, partly as a result of changes in dominant modes of thought and partly because of developments in technology which allow these forces to be recognized and tracked, even as they are bringing them into existence. In particular, the prevalence of data makes it much easier to compile lists of objects and to map them, to produce encyclopaedic renditions of things and to account and curate them, to map out space as a polytheistic pantheon of urban life, understood as a great 'meanwhile' (in the sense of 'meanwhile this was happening, and this and this and . . .). In other words, we now routinely produce what Bogost (2012) calls 'ontographs' – territories which constantly shift orientation and composition but still retain a kind of coeval force through their collocation and overlap,[3] what Massey calls the 'throwntogetherness' of disparate things messily occluded, both faraway and nearby:

> an ontograph is a crowd, not a cellular automaton that might describe its emergent operation. An ontograph is a landfill, not a Japanese garden. It shows how much rather than how little exists simultaneously, suspended in the dense meanwhile of being. (Bogost, 2012: 59)

Accordingly, this paper is in five main parts. The first part considers how the notion of instinct might be approached differently, as an outstinctive force which does more in the world as cities grow and mutate, becoming the foundation of a kind of sentience as new frictions and coherences are produced.

The second part of the paper relates this formulation to the case of the modern city, showing how the ways in which cities are threaded together have increased in number and intensity as a result of information and communications technology, thus providing for the emergence of a city which starts to become aware, not so much of itself as an entity (although that may be a part of the process) but more specifically of the process of emergence.

The third part of the paper then considers how we might think of outstinctual forces within this knowing urban medium in the future. I will argue that one productive way forward might be to conceive of them as producing a set of spirits etched into data-rich new materials, but of a very particular type. These are far from immanent forms. Rather, they might be thought of as akin to household gods whose remit is limited to very specific domains (Knapp, 2011), or more general spirits who only manifest in particular times and spaces, or perhaps the beginnings of something much larger: a kind of urban habilis, handy to have around (like the website with the same name[4]), or, again, something much more forbidding.

The fourth part of the paper then points to the ways in which it has become possible to simultaneously show and tell cities which understand them as emergent forces arising out of developments in the representation of space and the consequent channelling of vitality, flowing out of media convergence. In other words, other kinds of sentience are possible. A new landscape hoves into view which a new generation of artist-technicians is intent on forcing into a kind of existence by trying to invent new means of doing mo(ve)ment understood as composed of at least four dimensions: an unfolding in time, a perception or attribution of forces 'behind' or 'within' the movement, a particular spatial format, and directionality. This is about what it means to have a sense of aliveness which is going somewhere, understood through an interrogation of the 'how', rather than the 'what' or the 'why' (Stern, 2010).[5] It is a means of seeking out new means of punctuating space and time with the goal of recasting what we understand as movement signatures in situations where everything is understood as mobile and nothing is dead anywhere.

I will take three examples of this activity from artist-technicians working in time-based arts like music, dance, theatre and cinema. In each case, I will be trying to show how the materials that are used by these artists themselves produce a dynamics of existence and a mode of attention which is always more than human and which writes back on to humanity – understood as a transindividual complex – different notions and practices of 'human' as an interactive experience of the call and response of outstinct, rather as it turns out that it is the facial expressions of therapists that are the best predictors of potential suicides amongst patients, not those of their patients (Stern, 2010).

Finally, there are some brief conclusions

To summarize, new forms of how the world is being produced are being taken in, new forms of identification, empathy and internalization which arise out of the reengineering of what these processes can mean as a result of the growing preponderance of things which also function as links in chains of data and the new material surfaces that they engender. As we shall see, and as the example of therapy portends, this means thinking anew transference and countertransference as means of judging commitment to 'going on being', to the onflow of vitality (Stern, 2010). After all, things do not provide us with a simple reproduction of the world or even a translation: increasingly they stand on their own even when they are close to our concerns – as new material surfaces they not only tug at these concerns but also they become concerns that are jointly held. They can provide a kind of surrogate intelligence, another means of thoughtful becoming which is also a different kind of thinking, as part of an ecology of practices to which neither human nor object comes fully formed (Frampton, 2006).

Approaching instinct

Instincts have often been depicted as though they are completely inbuilt, wired in to the human body as the basic building blocks of behaviour, the equivalent of the unconscious response to stimuli of various kinds found in animals – like Konrad Lorenz's famous example of the male stickleback seeing red when it saw a red post van. But even the early adopters of the term like Wundt (1894) never thought of human instinct as simply a slavish follow-on from a particular stimulus. By the late 19th century, instinct had already come closer to a notion like habit. In particular, it was already being implied that different instincts could be nurtured by and in different spaces: in other words, different territories could produce different responses.

This spatial narrative has only been strengthened by recent work of all kinds which has stressed that the human body is not like a fortress surrounded by the integument of skin. It is always and everywhere associated with its surrounds. This is not just a matter of simply being in relation to a dense and all-encompassing 'environment'[6] of objects, although that is important – by one estimate we currently encounter 20,000 artefacts over the course of our lives (Bloom, 2005).[7] It is that human being requires a degree of association with the object world such that the objects associated with practices themselves guide what is possible and what can impinge on the body, redefining what the body is as they do so. Not only is the body dependent upon prostheses produced by its dependence upon tool-being arising out of bipedality and the subsequent development of the free hand but, in turn, these tools allow the surroundings to be redefined and made into different kinds of wholes or assemblages, or what Sloterdijk (2011b) calls 'spheres', each with their own particular 'atmo-spheres'. In other words, the body can become a moveable feast, redefining the world around it and becoming redefined in the process as it makes different calls to the various ensembles of objects that make up a second epidermis and, more widely, that resound in various ways. They become a part of the scaffold of an outbuilding which is also an inbuilding, by 'separat[ing] the human from the pressure of the environment, allow[ing] him to develop in a non-adaptative way and prepar[ing] the world-opening of the human, that is, prepar[ing] his sensibility for what is either spatially or temporally remote' (Morin, 2012: 84). Those calls must perforce be made by using or overcoming space. Space is not incidental, therefore,

but rather a vital part of what it is to be human: an enframing that allows the incubation of different ways of life by extending extension. Human being is about constructing surroundings in which such atmospheres can be reliably conjured up and replicated. Perforce that must be partly a technical production but one in which technology is no longer seen simply as a means of domination but as a means of carrying and cooperation.

Human sociality therefore *always* co-evolves with objects and space that provide more or less room to become something else. If that is the case, then social instincts need to be rethought as not simply ending with the organic body and as much more diverse than the few reflexes that are often cited as typical of human instinct. 'Human' groupings are always and everywhere made up of objects and spaces, as well as bodies, and each can substitute for, and extend, the other. They are reliant upon outstincts which act as permanent appellants in the world.

Equally, recent work stresses that objects and spaces also have their own presence, outwith human being. Such an insight chimes with the recent rise in philosophy of so-called speculative realism, a movement intended to combat the anti-realist strain in philosophy which, although it gave considerable attention to such notions as text, culture, consciousness and power, as what constitutes the world,

> gave us less a critique of humanity's place in the world than a less sweeping critique of the self-enclosed Cartesian subject. Humanity remains at the centre of these works, and reality appears in philosophy only as the correlate of human thought. . . . In the face of the looming ecological catastrophe, and the increasing infiltration of technology into the world (including our own bodies), it is not clear that the antirealist position is equipped to face up to these developments. (Bryant et al., 2011: 3)

Not surprisingly, the speculative (in the sense of trying to get at something beyond the concerns of the critical or linguistic turns) realist turn has fuelled work on objects and spaces which cannot be read to death. In its earliest guise, this meant movements like actor-network theory in which objects exist as elements of collectives but more recently it has involved the work of authors like Graham Harman (2011) who argue that objects have a life of their own and that the landscape of things must be imagined in a way that does not necessarily imply human access to the phenomenal realm in the shape of thought, memory, mind, fantasy, dreams and such like. There is a flat ontology where objects of all sorts and at different scales equally exist without being reducible to other objects and where there are no transcendent entities such as eternal essences outside of dynamic interactions among objects: as Bogost puts it, all objects equally exist but they do not all exist equally. In this conception, as Whitehead would have it, sentience is merely a difference in degree, not in kind, and reality can exist independently of human thought and, indeed, of humanity more generally since no object is the ground of all the others: human beings are 'rather objects among the various types of objects that exist or populate the world' (Bryant, 2011: 20).

In turn, the idea of life as an exclusive domain is under assault. The very intelligibility of what we regard as alive and aware comes into question since everything can be alive 'but none of it is alive in any naturalistic, let alone humanistic, sense of the term' (Thacker, 2011: 268). As Thacker (2011) makes clear, 'life' has always been a polyvalent concept and it is not at all clear that it can be dealt with in the classical Aristotelian way of ascribing an ascending pyramid of complexity and awareness or that, in some cases, that is a useful descriptor at all. What if life cannot be reduced to biology, for example?

If the existence of disasters, pandemics and nonhuman networks tells us anything, it is that there is another world in addition to the world that is there 'for us'. This is not simply a world in itself, and neither is it a world that is destined for us – rather, it is a world that presents us with the very limits of our ability to comprehend it in terms that are simply that of the 'in itself' or the 'for us'. It is a world 'without us'. . . It is the challenge of thinking a concept of life that is foundationally, and not incidentally, a nonhuman or unhuman concept of life (Thacker, 2011: xv).

There is one more point to make. It is possible to partially agree with the work of authors like Tuomela (2007) who see sociality as arising out of a 'we-mode' which is constructed out of a 'we-perspective' based on groups. But there is also a partial contrast with this strand of work, in that whereas Tuomela equates this we-perspective with the realm of the 'social' and with intersubjectivity, it is increasingly common to see human being not as a set of individuals joined by lines of social force in various kinds of groups but as an exercise which is based on different combinations of spatial arrangement which in turn produce different concepts, percepts and affects. This is the 'group subject' view of authors like Guattari referred to above. In these depictions of a flat human being constantly being remade in the moment and as the moment, spatial arrangements can no longer be considered as incidental. Rather, human being consists of a series of interlocking existential territories or planes or landscapes in which a sense of existence can be produced via various spatial constraints, limits and coordinates which act both to

immunize and to infect: space acts in many ways – as a magnifier, as a focus, as an anchor, as a boundary, as an enclosure and as an attractor. Various transindividual groupings, ensembles and machines are the primary generators of these territories and interiority establishes itself at the crossroads of these processes, crossing many territories, usually acting to confirm the state of things but every now and then setting up on its own account.

What is interesting is that animal ecology has all kinds of descriptors of these kinds of transindividual spaces, collective nouns like herds, troops, flocks, colonies, shoals, swarms, dances, mobs, murders, prides, clutches, scries and goodness knows what else, each with their own distinctive spatial behaviours. But the equivalent terms in human ecology are usually reduced to impoverished notions like race or tribe which usually involve some form of spatial determinism, even though it would be possible to argue that human beings are hive entities, mammals become insects which would not – cannot – keep still (Raffles, 2010). What if we could capture more dynamic notions of form in which space is the result of tidal forces which may suddenly swirl, surge and swash in abrupt or drawn-out, pliant or emphatic, regular or irregular ways which close off or perpetuate arousal? What if they could accelerate and crest, swell and burst, surge and fade in ways which link motion and form? Territory still exists but it becomes a part of perpetually renaturalized movement and can be constantly redefined and shifted.

To summarize the argument so far, in this paper, I want to argue that sociality must be seen through the prism of the spaces of landscape as a set of 'outstincts' which change with the make-up of that space. These outstincts are not based on simple reflex so much as on combinations of human bodies, objects and spaces working to promote breathable atmospheres, coupled with the basic human cognitive capacity of recursion: that is a procedure that can repeat itself indefinitely to create thoughts but is more than repetition or iteration since it can embed thoughts within thoughts. In turn, extended empathy and cooperation become possible, but an empathy which can take in a wider universe than the standard account of sociality and one which can allow nonhuman 'others', including the new material surfaces generated by a profusion of data, to have their say. This kind of generativity means very few outstincts are long-term: I assume that what we call life is perpetually dynamic and emergent. Classically, this was Nietzsche's insight (cited in Braver, 2007: 125) contra Hegel: 'the sole fundamental fact is that [the world] does not aim at a final state', but it is equally the insight of William James (1913) and many other authors too – the world is an exercise of 'things in the making'. History provides no sort of guide: there is nothing to go on except keeping on going on.

Fast forward cities

So far, all this probably sounds like a very theoretical way of approaching the technics of sociality. So it is time to try to ground it in the concrete developments of which it is both symptomatic and in which it is being worked out in practice. For what is at issue is a way of establishing an appropriate vocabulary which can begin to describe outstinctive forces, forces which are struggling to be born, which constitute new presences in the world but which are difficult to describe or, indeed, name (Lofgren and Wilk, 2006). But if there is one thing that is surely correct it is that we currently lack a complete vocabulary of emergence (and its corresponding noun 'emergency' understood as a sudden emerging (Solnit, 2013)) with which to describe all manner of things that are happening in the world, and especially the capacities of things which are both man-made and have begun to escape that making and even take on a kind of ascendancy (Braidotti, 2013). At the same time, we need to avoid a series of clichés, such as the revolt of the machines, which serve to distance us from the need to think. Lessons like those taught by Simondon (2011) about complex collectives and about beings being ontologically different in degree but not in substance are important here: 'it is a general problem of modern thought that a substantial difference between life (natural object) and nonlife (physical object) is presumed as a point of departure' (LaMarre, 2013: 90). But as the developments we shall examine only underline, that is a false and unnecessary distinction which assumes that there is such a thing as passive alteration on the part of humans and objects or objects and humans.

Nowhere is this state of affairs clearer than in the case of cities, for most contemporary commentators would agree that something is currently happening in the sociality of the urban realm but that they are not quite sure what it might be – with the result that they tend to fall back on existing clichés. That something stems from the continued growth of cities to the point where the urban realm is becoming the majority human – and object – experience. Thus, cities and metropolitan regions make up only 2% of the world's land surface but are already lived in by 53% of its inhabitants, a figure which is expected to reach 75% by 2050. These urban areas currently account for 80% of global economic output, between 60 and 80% of global energy consumption and approximately 75% of carbon dioxide emissions (Burdett and Sujdic, 2007, 2011). The 21st century is witnessing the great and final decanting of humanity out of rural areas into the 'arrival cities'

(Miller, 2012; Saunders, 2011) and so into full urban citizenship but with full economic citizenship trailing far behind: 33% of urban dwellers now live in 'slums'. Soon 'almost no . . . living soul will live outside city walls' (Serres, 2013: 5).

But there is a more general point to be made than simply reeling off these kinds of statistics to show that soon human life will be urban life and that the two terms are rapidly becoming interchangeable. It is that number and concentration of population mediated by all kinds of technologies of transport and communication produces a different kind of urban medium. This is a qualitative as well as a quantitative shift. As importantly, these populations are not just bound together by this infrastructure but begin to merge with it, producing a constantly shifting template of concepts, percepts and affects in which human beings can no longer be considered as the only actors. Rather than acting as simple relays, what might be called the world of things (within which I include the material surfaces made possible by Big Data) comes to occupy a central place, confirming the tenets of speculative realism but no longer in abstracto. Cities contain many different demographies of things as well as people and other organic beings, tied to each other in manifold ways. Now more than ever, cities are our partners in the world, something that we constructed but which are now more than us. Human sociality has become urban sociality. What we have understood as instinct becomes able to be perceived as outstinct which has always been present but is now able to be sensed and recorded in ways which have never before been open to inspection.

Indeed, as cities have aggregated so have they started to gain their own emergent forms of agency, their own 'capa-cities'. They can no longer be thought of as simply sums of their parts, if they ever could, or as collections of externalities. Cities are more than collections of flows channelled by their various infrastructures: they are not just a set of assembled entities. That would be to mistake the level of properties for the level of capa-cities and so to mistake entities that can only be enhanced or diminished for relationalities. Rather, cities are means of revealing new things, means of fostering and animating ramifications which are centrifugal in nature. The new technologies that now bind cities together make this kind of relationality easier to initiate and conjugate because they are premised on modes of control which open up to let things happen and then try to modulate the results in a never-ending cycle of call and response (Thrift, 2011).

Of course, cities have been linking up in such a way as to begin to realize this vision of a form of sociality running on the principle of ramification for some time now. Cities began to coalesce when the first concentrated systems of transport and communication came into being, producing great chains of energy (Morris, 2010). By the middle of the 19th century, various systems for the supply and processing of food and other essentials had crystallized and were already going global. Flows of information were becoming more coherent too, whether through the medium of the newspaper and the telegraph or even lighting: during the 19th century Britain became the first gaslit society, with electric lighting arriving subsequently in 1878. Lighting produced significant dividends for the population as a whole such as new practices of safe transportation and private reading, as well as institutional efforts to collect knowledge. Contrary to the presumption that greater illumination only helped to create a society controlled by intrusive surveillance, the new radiance often led to greater personal freedom and was integral to the development of modern liberal society and urbanization (Joyce, 2003; Otter, 2008). That said, the British government significantly expanded its power to observe and monitor its subjects, whether through developments in the science of perception and lighting technologies or through associated practices of urban design and government administration or indeed through new means of exact visualization like the maps that enabled increasingly sophisticated understandings of evolving networks: 'in the end, almost everything got mapped: air travel, the Travelling Post Offices, the location of letterboxes, the walks of postmen, bicycle routes, tidal activities – the list is seemingly endless' (Joyce, 2013: 127). In other words, just as the language of the streets began to sound modern in Dickens's novels because of the modernization of the streets (Grossman, 2012), so these systems produced not just quantitative but also qualitative change through the power to observe and monitor subjects, through the ability to open up new spaces of movement and interaction and through the growth of associated imagined communities.

But, in the fantasy writings of conjoint authors like H G Wells or H P Lovecraft or Olaf Stapledon or David Lindsay, it is already possible to see premonitions of something new and quite different again, a teeming imagined city controlled by reactions to each and every other's reactions but also involving a strong mystical undercurrent of a Manichean struggle with echoes back to at least Blake. In the 1970s and 1980s, these kinds of 1920s visions began to take on a more coherent form as information and communications technologies started to hold sway, making links in ways which would not have been possible before, thereby producing the idea of a 'digital' and then an 'intelligent' city which depended upon a parallel networked urban architecture. In the 1990s and 2000s more and more writers made the claim that cities were becoming 'smart', a claim that was seen as a

step on from the notion of an intelligent city in that burgeoning information and communications technology networks manifested themselves as a kind of nervous system because of their readiness to face constant change (McCullough, 2013).

And that change is happening in however a piecemeal way. To begin with, cities are becoming 24 hour operations. That was always the case to varying degrees but what is different now is that the strong rhythmicity in activities that used to characterize the temporal structure of cities is declining. Second, cities are constantly boiling. They are linking and delinking, connecting in ways which allow ties to become temporary nodes, most especially as wireless extends its grip (Mackenzie, 2010). Third, cities are streaming. Interfaces are becoming representations of time as well as space (Galloway, 2012; Gelertner, 2013) as heterogeneous, real-time streams of content become the norm. Each person will be able to keep tabs on many streams of content at once, whether the most mundane, like tracking a parcel, or the most esoteric, like religious observances. The city and its inhabitants will tell their own stories made up of time-based content endlessly being updated.

Now there is talk of cities becoming 'sentient' which can be seen as another step on again. This is an epistemic claim that deserves closer attention, not least because what 'sentient' consists of is rarely specified exactly. But care needs to be taken: the kind of sentience that cities can manifest is based on the technical possibilities inherent in the internet: these are based on correlations rather than causes, on a surface which allows difference to be continuously registered, on a procession from the past into the future, and on perfect recall (Esposito, 2013b).

Currently, five of the tendencies that began to be manifested in embryonic form during the 1970s and 1980s have begun to coalesce and, in turn, produce something that might be described as beginning to approach sentience, albeit of this specific kind. The first and most obvious of these five tendencies is the sheer prevalence and profusion of Big Data (Mayer-Schonberger and Cukier, 2013). But it is not so much the profusion of data which is at issue, in a world where one social media company, Zynga, can already generate five terabytes (the equivalent of about 1.5 million song files) of data on customer clicks each day. Data scale and richness is now taken for granted. It is what comes after that now strikes home. What is at issue is the labour of description which entails new kinds of analytical intensity. That issue will affect all the spheres of urban society. Take the urban economy as one example. As marketing becomes pervasive so 'marketing is going to become a much more science-driven activity', as Watts (2011) would have it, an activity which will not just routinely mine vast amounts of data but then intervene to make it more relevant to matters of commercial concern by taking in activities like design and publishing that were formerly thought to be separate in order to maximize 'touch points', using modelling techniques which are themselves constitutive and start to produce sentience. Equally, the labour of description requires new means of representation. The rapid rise of new means of visualization is a particularly good index of this. Visualization is an attempt to produce a new visual medium, not just a set of tools (Yau, 2013). It is an art that converts number to sign and which must be a visualization of not only the raw data but also the rules that allow that data to be transformed (Galloway, 2012). As an art, it is still in its infancy but what it offers is the means to see data as a material able to exist at many different levels of granularity with different levels of depth and resolution, just like other materials. Indeed some commentators have likened data visualization to the process of cooking, enabling new materials to be conjured up via multiple techniques (see Manovich, 2013).

The second tendency is that data become self-referential as calculation becomes increasingly performative. A good example is provided by code (Amoore, 2011). The rules of association between data are themselves constitutive, derivatives of different kinds of data which then become primary, often through various means of data fusion (Manovich, 2013). These derivatives are modulated norms which infer what a population might be, which deal in proclivities and potentialities rather than attempting to enclose and discipline (Foucault, 2007). That means that they can work in unexpected directions and with sufficient free play that they might be thought of as a kind of sentience without any deep understanding. Rather, they remain on the surface, making correlations and measurements continually emerging without any need for resolution. More generally, second-order observations become more and more dominant: movement is not explained by reference to the world but rather by reference to observation and its structures, which offer data not on how the world is but on how others observe it. Thus searches, to provide just one example, do not only generate information but themselves constitute new information (Esposito, 2013a).

Then, as a third tendency, there is the issue of what can communicate with what. In contemporary cities, new forms of machine-to-machine interrelation have been brought about by the rise of collective automation. For example, take just the example of the urban economy. Business processes that once took place between humans are executed electronically 'in an unseen domain that is strictly digital' (Arthur, 2011: 1). Arthur (2011) calls this 'conversing, triggering and

executing' (p.2) a second economy of intelligent, automatic response which provides a 'neural layer' for the physical economy.

> Now this second, digital economy is not producing anything tangible. It's not making my bed in a hotel, or bringing me orange juice in the morning. But it's running an awful lot of the economy. It's helping architects design buildings, it's tracking sales and inventory, getting goods from here to there, executing trades and banking operations, controlling manufacturing equipment, making design calculations, billing clients, navigating aircraft, helping diagnose patients and guiding laparoscopic surgeries. (Arthur, 2011: 3)

The point is that a conversation is being conducted exclusively between the billions of things in cities and is being endlessly reconfigured in ways which form a kind of sentience: more than half of internet traffic now comes from nonhuman sources (Urbina, 2013). Much of these entities' functioning lies without direct human perception, precisely because it now bounds what that perception is. But it can impinge on human perception when machines simulate human being. Thus, the rise of social bots and so-called persona management software is a widespread phenomenon which means that much of the interaction which appears to be with and between humans is actually with computational machines (Isaacson, 2011; Urbina, 2013). Thus, as little as 35% of Twitter accounts may be actual people and many social online networks are similarly tending to the machinic: on one estimate, within two years 10% of activity on these networks will be social bots.

A fourth tendency is the expansion of sensors. At one time, sensors used to be based simply on the idea of a trigger occasioned by movement or signal. But that is no longer the case. Sensor technology works in many sensory registers, including touch (as in various forms of haptic technology), smell (as in electronic noses) and sound (as in the developing technology which allows very thin microphones and speakers to be placed pretty well anywhere) and is being loaded into all manner of everyday objects (down to and including the most mundane objects like eating utensils). Sensors are also becoming a mobile sensorium, most especially through the introduction of drones which are likely to become a pervasive technology. But, most importantly of all, sensors are starting to actively shape their environment. For a long time, it has been known that sensors do not just interact with but actively change their environment but this insight has now been extended in several ways. For example, sensors are becoming elements in systems which can assess the reactions of what they sense. Thus, advertising, through the medium of screens which include cameras, is moving towards gauging individual consumers' reactions to advertisements and entering into conversations with them about their choices (*Economist*, 2011). All kinds of gaming technologies are starting to react directly to their customers through motion capture and the consequent ability to move away from screens understood as specialized interfaces. And increasingly, through software designed to create greater 'push', it is becoming possible to directly model and intervene in choice, nudging it towards desired ends. Sensors can also work directly on the multitude of images which they produce, making the world more plastic and malleable. It becomes possible to write the world through 'images' produced by sensors and software in ways which were never possible when writing was associated simply with print.[8] For example, advertisers are now working with the possibilities afforded by using facial recognition systems to react to individual reactions to sales propositions made on screen.

Finally, there is the growth of ambient environments in which data on the spaces of the city are continuously fed back in such a way as to produce awareness of locational context through processes like bounding and tracking which depend upon giving every object a location so that a constant and constantly changing map of the city, drawn in many dimensions, can be produced through active participation in emergent networks: 'rather than a map that informs how one moves through a city, one's movements inform the map' (Shepard, 2011: 26). In turn this production of pervasive space, currently typified by Google Glass, leads to cooperation between component data streams in order to etch new derivative spaces which again form a kind of sentience. Space is not just loaded up with data correlates but becomes an adaptive feature of how space is and, in turn, provokes new understandings and activities: 'we are now beginning to see social practices emerge by which location-based or context-aware media and information are consumed en-masse in urban environments and, in turn, how urban space is transduced in the process' (Graham, 2013; Shepard, 2011: 25). In particular, the growth of urban operating systems presages a time when it will be possible to monitor and manipulate not only large-scale events like traffic flows (for example, by guiding cars to empty parking space or analysing room vacancies in order to minimize energy budgets) but also local phenomena such as the temperature sensors inside individual rooms or the location of small children. To give just one example, Urban OS, an offshoot of Living PlanIT, has developed a single platform which is able to manage the entire urban landscape by connecting up all the devices in a city (Moskvitch, 2011). It includes an extensive set of application services, inevitably dubbed PlaceApps, which will act as the urban

equivalent of apps on smart phones: indeed, in time, it is intended that the apps on smart phones would be linked into the system. To begin with such systems are being built into prototype new towns like PlanIT Valley in Paredes in Portugal or New Songdo in South Korea which will have millions of sensors embedded in their fabric, each sensor sending a continuous stream of signals to an urban operating system which will run the town with minimal human intervention.

However, PlanIT Valley and its ilk are only one element of what it means to occupy an ambient environment. More generally, one can see a general tendency towards the possibility of capturing, storing and manipulating movement. As Portanova (2013) points out, what we can see as coming together in cities are a mixture of serried data flows, new technologies which both generate and work with these flows, sensors that detect and capture movement, and the bodies of movement knowledge which inform all of these developments, whether they be game design or dance, medical or traffic engineering, performance or air traffic control, special effects or animation, military or athletic training, amusement park design or installation art, or pictographic languages like sign or facial or gesture recognition. Thus 'environment' no longer describes a set of static co-ordinates forming a frame within which bodies move but a continually changing tableau in which bodies appear to have motility and which therefore has the ability to redefine itself in real time. The fixed frame becomes a continually unfolding, fluid and convective map of different kinds and rates of movement in which signs standing for just one thing become portmanteau signs which blend together many different things by virtue of having the same location, if only for a brief period of time: the same event can be many things at the same time. Techne can no longer be thought of as a substrate, as a set of artifacts, but rather as a set of techniques which are continually unfolding: the 'environment' has to be understood as continually taking form, like an ecology (Galloway, 2012; Manning, 2013).

Whatever the case, some considerable care needs to be taken in making claims to an urban sentience. The claim is not being hoisted that the city is aware of itself in any human way. Rather, the claim is being made that, as computational objects have developed, cities are able to take on new forms of vitality (Stern, 2010), forms of vitality which can develop over time. Perhaps one way in which we might consider this question is precisely through looking at how vitality develops when computational things are explicitly included in the contours of experience. Then it becomes clear that it has only gradually arisen, line by line, algorithm by algorithm, program by program. Cities are full of a whole new layer of emergent entities which, because they are underpinned by code using data as fuel, might be thought of as akin to sentient beings, in that they are able to produce some level of transference through correlation and measurement. As Fuller (2011: 181) puts it:

> Cities can be characterized as a concentrated process of the gathering, enfolding and dispersal of (specialized) . . . spaces. In becoming strange themselves through such specialization and congruence, they create mutant fitness landscapes for forms of intelligence to interpret, cohabit, or to disperse from.

Through a process of transduction[9] which allows the gradual propagation of an activity, 'basing that propagation on a structuring of the field enacted from place to place' (Stengers, 2011: 292), a kind of speculation about existence becomes possible born out of the perplexities that abound as different armatures of the city come into contact with actual situations. After all, many modern programs do allow for some degree of learning and there are all kinds of capacities for interference in activity which create an appetite for new obligations. Thus, the degree and type of awareness of an environment that a city manifests can increase as its environment is progressively augmented by more and more information and communications technology, at least in the Whiteheadian sense in which all entities have at least some degree of consciousness but that degree varies markedly.

I hope that I have made it clear that in describing such a city of sentience, it is imperative not to understand sentience as equivalent to human intelligence. But there are two caveats to be made. One is that human intelligence is itself a partial thing. It hardly bears repeating that the bulk of human intelligence is automatic and does not involve conscious cognition. Human intelligence is designed to repeat practices which are an amalgam of physical and cultural capacities and cognition is an important part of the variation of these practices, but it is still only one element of their constitution. Then, there is a sense in which objects themselves already think, at least in the sense that they render one another. 'Feeling-by-nervous system' is not the only kind of sensation and we cannot make the assumption that the way that we think is the way that all things have to think if they are to be worthy of the term: that would be to repeat the classic correlationist conceit (Bogost, 2012). In other words, we need to be careful to understand that sentience is always a partial and emergent thing, one which can take a number of forms.

What is much more problematic is to move from a simple sentience to the quality of awareness,[10] a quality which can take many forms. Here I will concentrate on just one of these forms, namely spatial awareness,

because being able to ask 'where?' is such a basic element of what might be mooted as awareness. Increasingly, many objects in cities and, indeed, cities themselves, do have an ability to sense their environs, an awareness which is cumulative because this new-found spatial awareness allows the construction of second-order representations of what it is that is being represented. Of course, many of the ways in which that is done are severely reductionist (not that reductionism is necessarily a sin or does not work as a means of sensing) but not all responses are necessarily of this type.

As any basic theory of affects would have it, all beings have some spatial awareness, however limited, of their environment. But that is fundamentally different from having a sense of identity in the way that human beings think of themselves as occupying and being in a space. Most recent research suggests that this ability is linked to the development of language which allows the *combination* of different domains – including the most basic domains of all, ancient systems shared at least in part with other animals such as object representation, approximate number sense and geometric navigation – which, in turn, feed back into enhanced cognitive spatial abilities. Perhaps the most revealing research has been undertaken by Elizabeth Spelke and her co-workers (Hyde et al., 2011; Lee et al., 2010; Spelke et al., 2010), who have underlined not only the importance of geometric and landmark cues, both direct and indirect, in wayfinding but also the importance of spatial language in integrating these cues into representations. Spatial-navigational experience by itself is not sufficient, not least because the human brain, like the brain of animals more generally, does not construct mental maps in the sense of Euclidean geometric maps of the environment but navigates according to a combination of the shape of the surrounding surface layout and so-called beacon guidance, that is by learning the relationship between a goal and a visual feature, thus allowing a rough and ready reorientation when required. But we need to be careful. Cities' spatial awareness might take a different form from human awareness and still qualify as awareness. Thus, cities might come to have a spatial awareness modelled on other diagrammatic models of cognition rather than human ones, simply because of their ability to apply much more distributed processing power. And they might be able to display a certain form of emergent cognitive spatial ability, not least because of the vast number of different events and objects they are able to apprehend – with their unexpected correlations and serendipitous circumstances made plainer by new forms of mathematics like extremal combinatorics.

This might be a particularly germane hypothesis if the awareness of space was being formulated with a different goal in mind, not so much as a time-specific presentation and more as a continuous streaming presence. Increasingly, after all, all manner of software is moving away from what might be called simple nouns and investing in verbs on the premise that machines must convert to doings, to practices. That means investing much more effort into generating and investigating crowds of vague feelings, rather than direct causality, crowds which 'testify, simultaneously and inseparably, to a body and to things' (Stengers, 2011: 401) and to what is held in common between them. And, equally, that means a wholesale mixing of spatial genres, rather like the mixing that occurred when Courbet and then Manet mixed portrait painting (understood as a distinctive physiological and psychological likeness) with genre painting (understood as scenes from contemporary life) with the net result that the divide between human beings and objects became redistributed.[11]

So perhaps there is a sense in which objects in cities and cities themselves can have certain kinds of awareness of themselves en masse, including a recast spatial awareness. As each of the five tendencies set out above links up in a cat's cradle of relationality, so a kind of self-awareness is able to come into being in the sense that an *authoring* is taking place, an authoring which is emergent and therefore hesitant but still shows flashes of self-organization. Such authoring is no doubt still a rare and partial condition but it is possible to argue that out of analytical intensity, the emergence of data derivatives, machine-to-machine conversation, the profusion of sensors and a general locatability, cities are gradually awakening from their slumbers and gaining a limited outstinctual self-awareness: 'not quite the ''smart'' city we've been promised by techno-evangelists, yet not exactly dumb either' (Shepard, 2011: 31).

Thus, cities can now start to resemble not just collectives made up out of many entities each with their own modes of inhabitation and sociality, but entities in their own right with 'something in mind', able to become part of outstincts arising out of a dynamic dialogue with the myriad parts of their ecology. But it is no longer the old organic metaphor that we must call upon, or even a neural one, in order to understand this unfolding and shaping. Rather we might see this 'natural world', to repeat Ackroyd's phrase, as the first glimpses of a process of evolution of a topographic sensing/sensibility (Sinclair, 2011), a spatial awareness based upon the kind of diagrammatic thinking outlined by Mullarkey (2006) in which diagrams, as instances of 'almost matter' as Bergson called them, are a part of the 'external mind' wherein shifting perceptual inferences are laid bare, inside and outside are combined, and the between is able to be shown (Munster, 2013).

What we see is a new set of spatially variable surfaces arising which are malleable, which contain data about themselves, and which link to other data, often in

continuous ways. Data become a material (Kuniavsky, 2010): 'information processing no longer defines the identity of an object, but is one of many materials from which objects can be made' (McCullough, 2013: 198). New kinds of 'cooked' alloy can appear, in other words, which combine data and other materials in new ways and, just like cooked food, release more energy (Wrangham, 2009). Three-dimensional printing, holography, robotics all presage a time in which surfaces can no longer be thought of as backdrop. Data become surface becomes material becomes surface becomes data. Just as cells have been found to have moments when they make decisions, however attenuated, about their environments, so these new materials have extra options in deciding where and what to do. What starts to come into existence are means of producing surfaces that can mould, meld, and age, and create infrastructures which are both utilities and their products, which are lived in, not on, which can combine situation and response and so can provide shade and nuance.

In other words, an awareness starts to arise which invents the means to submit to its own requirements, to activate its own activation. Such an ontographic process of continuous escalation (Sloterdijk, 2012) depends upon three different processes. First, and most obviously, there is the growth of an anthropotechnic humanity which is irrevocably linked to the machinery of information and communications technology. This is a humanity which can no longer claim the illusion of individuality (although it is still, of course, subject to individuation). It works in swashes of 'outstinct', bundles of habits nurtured by the new urban spaces, anchored by the peripheral awareness and continual annotation provided by technologies of chatter and touch, informed by the continual positioning that is the result of the new locational technologies which continually situate each person as moving dots on a map, and able to construct temporary objective subjectivities of desire and limitation which are no longer based on purely intersubjective relationships but can go for a transindividual wander within a wider compass than formerly. People and things can 'author' different pockets of the city in ways which are simultaneously individual and collective, the techno-cultural equivalent of the 'cosmopolitan canopies' made famous by Anderson (2004, 2011).

Second, and relatedly, there is what Sloterdijk has called 'densification', a phenomenon which happens when there is no longer an 'unknown, unconnected outside' into which human existence is able to move and thus humanity is forced to create new houses of being which make facets of the inside into new outsides (Morin, 2012). New layers of existence are created which arise out of the proliferations of connections that are now possible, rather like the layers in modern interactive maps which reveal more and more possible descriptions/existences. In other words, compression produces pressures to produce new lands, new living spaces, by redefining room in what has become a 'constant earthly present' (Sloterdijk, 2012; Thrift, 2012). So we arrive at a different kind of 'sphere', a city in which the dissipative coherence of a self-organized activity machine rules by pre-empting the event in a continual game of stone-scissors-paper (Sloterdijk, 2011a; Stengers, 2011).

Then, third, there is an increasing awareness of a physical world constantly chattering to itself, a monstrous externality (Sloterdijk, 2011) which humanity can never fully know except as a phenomenon which is at the edge of awareness, the contemporary correlate of the spirit world of yore able to 'talk back' through its ability to galvanize, synchronize and synchorize. The object world bleeds into the human world through new articulations and indeterminacies as the physical world is given the resources with which to speak, both to humanity and to itself. This process sets in motion a 'progressive redistribution in which what were things of the soul are shifted to the sphere of things and the previously subjective into the scope of the objective' (Sloterdijk, 2012: 177).

A 'great and monstrous thing':[12] Cities as ontographs

In what follows, I want to speculate about what cities might look and feel like in the future, perhaps 50 years hence, when data-rich materials have become an unconsidered fact of life and the currents of outstinct they gain their energy from have begun to take on what might be thought of as a spiritual form, as least insofar as it promotes a kind of animism in which everything counts as humanity (Melitopoulos and Lazzarato, 2012).

I will work according to a number of principles. First, I take it that there is no such thing as modern or modernity, just the continual roll-out of a messy and often incoherent history embedded in active-contemplative practices that can be remarkably open in how they can proceed into the future and remarkably tribal in how they exist in the present. Thus, the idea that a point in time was ever reached when history transited to a post-traditional and secular state of affairs is largely specious. Second, and correspondingly, I take it that many of the practices we now take to be business as usual are no more or less rational than those of the past. Just because they are surrounded by the raiment of the internet and Big Data does not make them more intelligent or intelligible. Indeed there are good reasons to believe that practices like divination are *more* likely to be found when there is so much data that rational

techniques alone are unable to provide reliable guidance: financial markets are an obvious case in point (Esposito, 2011). Such practices of divination often appeal to a higher logic without the ken of human beings which requires its acolytes to be able to interpret supernatural signs of order and uncover mysteries. Third, I also take it that many practices are highly local but are arrayed as though they are general – that is how practices gain their power. Thus, dualistic notions like nature and culture that may seem to be indispensable might just be yet more waystations in the history of history. There is no reason in principle why other ways of proceeding which hold out for a much greater reciprocity with nonhumans – like, for example, animism or totemism (Descola, 2013) – might not again hold sway, yet alone other ontologies like Shinto which we can see as forerunners of what is to come. Whatever happens, superstition, supernatural explanation, ritual and revelation, mystery and magic, will continue to continue.

We cannot easily know how outstinctual capa-cities and ambitions – if that is the right word – that are captured in new data-rich materials might manifest themselves as sentience, not least because we have yet to satisfactorily name either many outstincts or these new code-heavy forms of materials. So what might these stronger or weaker authorings consist of? Take just the case of coded cities understood as a whole. Should we think of them simply as projections of an autistic capitalist power in which all consequences are externalized? Should we think of them as entities gathered around matters of prescribed concern and uninterested in much that lies outside them? Should we see them as tied into a kind of ethic of care by the need to roll over systems which demand resilience? Should we see them as having an increasingly involved dream life, based on projection and retrojection of all the searches, blogs and tweets that are continually being generated? Should we see them as geometric beings, born out of constant requests for navigation? Should we see them as the result of newly found abilities to represent arising out of advances in visualization? There is no set format or single cause but what is clear is that it is increasingly possible for these entities to learn – in however a limited way – to transform themselves, to author themselves either through emergent tendencies arising out of complexity or through simple happenstance which places them in unexpected situations which require adaptation.

What seems clear is that as these tendencies/entities settle in to practices of various kinds, so they will gradually be ascribed causal powers, whether they have them or not. There are at least two reasons why this ascription is likely to happen. One is the fact that human beings instinctively assume that objects possess certain properties such as cohesion, solidity, continuity and contact (Bloom, 2005). Stuff comes loaded with these properties: without them stuff does not qualify as stuff. So coded objects which may, in fact, be networked phenomena will still be assumed to have these qualities: in everyday life, at least, it is the only way we can think about them – as familiars if not as friends, as organs if not as bodies. Then, there is the inevitable human tendency to ascribe causality to objects. Many authors have shown that human beings automatically anthropomorphize (see, for example, Guthrie, 1995). We are hypersensitive to any sign of agency (Bloom, 2005). Indeed we are so sensitive that we often see intention where none exists or, as Guthrie (1995: 5) puts it, when 'the clothes have no emperor'. 'We have an unconscious suspicion that we are in the presence of something alive or humanlike, which in turn stems from a strategic practice' (Guthrie, 1995: 203). This anthropomorphic trigger happiness means that we are increasingly likely to see cities run by information and communications technology in intentional terms. As Turkle (2010) has pointed out, this tendency towards over-attribution does not mean that we will necessarily come to see cities and their constituent systems as alive but we are likely to ascribe awareness to them, if only in the form of a rudimentary psychology of call and response. If this is the case, it follows that cities are increasingly likely to both be and to be inhabited by artificial entities and, indeed, these entities, and cities themselves, may well be ascribed some form of agency. They will join a parliament of things that are counted as expressive projections of not just allusion but action (Latour, 2005). But what form of agency might this be?

In other words, how will we regard these artificial entities, if not now then in the near future as they settle further into our practices? Peter Sloterdijk's linking of the spiritual and the objective can give us one clue. I want to argue that what we are seeing is the birth of a gathering of spirits like sprites, shades, demons and gods which are bundles of the kind of activated outstinctual sociality I have been discussing. To make a claim like this is to make a claim with a lot of baggage, to put it but mildly, although perhaps it is not quite as great a leap as all that, given the presence of a felt second city of ghosts and spirits that has lurked – and still lurks – beneath the surface of so many cities, preternatural entities which are used to both explain and ward off the frequent moments when infrastructure fails.[13]

So, how might we think about these emergent forms of secular spirits, if that is not a contradiction in terms? They are conjunctive swirls of data and analysis with varying degrees of anchorage that have become more than just algorithmic presences, both intimate and impersonal at once, friends and familiars, certainly,

but also bots. They are neither purely object nor purely human but rather an emergent mosaic of relations with their own capacities for recursive thought brought about through various kinds of inventive diagramming (Munster, 2013).

Perhaps this new family of artificial entities is best thought of as *sprites*. The use of such a term means that we can play with three separate meanings. To begin with, there is the sprite as it is understood in computer graphics, originally used to refer to a two-dimensional image or animation that is integrated into a larger scene[14] but nowadays usually applied more loosely to refer to various kinds of graphical overlays which result from combining background graphics. So a whole stands for the parts and the parts for a whole. Then, and following on from this basic diagram, there is the sprite understood as a source of sudden energy, such as the large-scale electrical discharges that occur high above thunderstorm clouds as luminous reddish-orange flashes and spread quickly. Then again, a sprite can be an elemental spirit. Thus, a sprite can stand for a technological entity which is ascribed agency because it is connected to a larger whole, has energy and so can do work, and is able to conjure up an expressive presence, however circumscribed that knowledge and power may be.

Then, what might a family of sprites include within its ranks? First, there is the case of the sprites that used to inhabit many polytheistic cultures, diminutive spirits that were often based on a genius loci, the protective spirit of a place, and were concerned with invoking efficacious supernatural powers which could, 'with the proper approach, be enlisted in solving the practical problems of the day such as illness, frustration in love, and vengeance against one's enemies and rivals', that is they acted as 'a central tool ordinary people used to address their everyday problems' (Knapp, 2011: 18). These spirits were believed to observe, protect and influence what happened within the boundaries of their location, which could be large or small. They had limited scope and potency but were still regarded as efficacious within defined limits because of their power to make ordinary space sacred. The spirit might be just a set of simple superstitions, folk explanations which stand behind the highly localized ways of hearth and home which cities used to refer to that are now being recaptured through digital landmarks. Or they might be much more complex affairs.

A range of these genius loci is being actively constructed around us through the automatic representation of place arising from programs that utilize spatial search (Graham, 2013), or more specific programs that use the principles of phenomenological architecture or immersive experience. In particular, more and more software is producing location-specific communities which sail under the same set of interests, so-called livehoods (see http://livehoods.org/), or is producing crowd-sourced digital representations of place (see http://sitemapcom).

Second, we might think of a set of general sprites only able to manifest in certain places. This is not exactly the same case as found for household gods. Rather, such spirits are able to manifest in places only if the conditions are right. Many figures of folk wisdom are able to be powerful only under certain constraints: vampires and werewolves or zombies or ghosts come to mind in modern cultures, or saints able to manifest if the conditions are right in older ones.

In their modern manifestations, they are conjured up by aggregations of information reaching a critical mass, rather like the object equivalent of flash mobs or trending on Twitter, or by being wired in to specific locations, as in the case of conglomerations of cameras, radio masts, and sensors of many kinds, and so on. Thus, the actual location of manifestation may be mobile and variable in strength.

Then, third, we might even see this sentience as the birth of a shambling but increasingly integrated set of godheads, arising out of a hesitant litany of different interests which starts to coalesce – rather like the Emperor Augustus's reorganization of the small gods of Rome into a consolidated imperial religion which converted a local patchwork of spirits into a consolidated dynamo of gods and religious observances which both reflected and produced imperial power. These godheads might be coincident with particular cities but equally they might arise out of coalitions based on mundane cross-urban and cross-national interests like various kinds of infrastructure, formulas and bureaucratic routines acting as generalized intervention machines.

Now I am well aware that this argument can sound like the worst kind of science fiction hyperbole with its favourite trope of icy and all-powerful AIs. But it may be that this kind of hyperbolic thinking (Sloterdijk, 2011) can be reframed so that instead we see something more akin to the naturalist Joe Hutto's apparently faithful wild turkey, 'Turkey Boy', an entity nurtured and cosseted by Hutto from birth but then, through the power of in(out)stinct suddenly wanting out of companionship (see http://www.pbs.org/wnet/nature/episodes/my-;-as-a-turkey/introduction/7268/).

Or we could see cities as becoming the preserve of Homeric archaic-modern conglomerations of coded systems which are transforming into entities that are gradually gaining strength, their stern mien not so much unforgiving as without the conscience that would enable them to grant forgiveness in the first place, 'their faces set like NO ENTRY signs', to quote Christopher Logue (Logue, 2001, 2003, 2005).

Such cities would act as though they are in a state of 'all day permanent red' (Logue, 2003), their systems continually alert to criticality,[15] and continually seeking out a kind of steaming, streaming transparency which would make the present immanent (Harman, 2011). Born out of the security needs of the modern city, these cities would depend upon the dubious pleasures of conflict, of fear and anticipation, of security and abandonment; 'blood, blood like a car wash': emergence would always be an emergency. The Homeric theme echoes in other ways too:

> everything is specific and concrete. There is little abstraction or speculation: here are these men, here are the gods, and here is the war; 'high reliability fast forward pain'. (Steiner, 2002: 15)

In other words, affect is the same as action, the gods are frail and idiosyncratic entities – personal impersonals – and their jealousies and vendettas have real consequences.

But it is important to understand that this kind of military or paramilitary understanding of spiritedness – of 'priests sharpening their steeples' (Tempest, 2013: 19) – is only one side of the story. There is also the imperative of the circus of entertainment to be worshipped. One only has to think of the crossover between militaristic and entertainment styles, especially in addictive practices of repeat play found in computer games or, indeed, many modern practices of gambling (Schull, 2012). The Homeric comparison works here too, as war music (Logue, 2001; Oswald, 2011). This is where an age of vocative and invocative poetry intended to be read aloud and jar as well as seduce meets the cinematic visual tropes our culture is so familiar with, in the manner of a director like Kurosawa or, indeed, endless television crime series – or even rap videos (Tempest, 2013). So the style of computer games, many forms of machine gambling, and the like is relentlessly filmic, syncopated and percussive: the lapses into present tense, the quick cutting between scenes, the reliance on collage and montage, the emphasis on the visual and the panoramic, the script notations and the instructions to camera, the compaction and the general sense of prophecy, are all familiars (Steiner, 2002). Here is a kind of romance of the empirical played fortissimo: 'King Agamemnon and Achilles face to face, Distinct as polygon and square' (Logue, 2001: 21), both the language of affect and emotion and force *and* the language of geometry: space come alive. This is where the Romantic sublime goes to die and to be reborn as a 'a netherworld of the digital realm – where the gods of machines wander apocalyptic landscapes, communicating with each other and with whatever programs preserve the individuals who built them' (Carrion-Murayari, 2011: 17).

Playing with gods and playing gods: Unleashing vagrancy

But, at this point, it is important to note just what kind of a sentience I am describing here. It is chiefly a sentience occasioned by the existing lines of corporate and state power manifested in the security–entertainment complex, what I have called elsewhere Lifeworld Inc. (Lanier, 2013; Ngai, 2012; Thrift, 2011). Standard writings on the future of cities often conjure up a gleaming, crystalline city in which collective automation delivers a kind of utopia or its exact opposite, a windblown wreck of a dystopia. But there is no reason to think that this will be the outcome and good reason to think that the result will be a lot more messy. As cases like the use of mobile phones in African cities or the use of biometric smart cards for the identification of slum dwellers and the homeless in Delhi show, greater and greater computing power can co-exist with extensive poverty (Sundaram, 2009). There is no reason to think that a growing urban sentience will necessarily deliver greater equality or comfort or freedom. It can rule over wastelands as well as wealth, over shipwrecks of frivolity as well as carefully husbanded projects.

But if urban spirits and gods are emerging, if a kind of technological bestiary within and of cities is appearing – superlunary or not – then there are also all kinds of frayed and loose outstinctual ends: things do not always join up. If there is a vocabulary we really find hard to articulate, then it is surely this one. Contemporary cities are full of loose ends and failures of control, both large and small. It is in the nature of current modes of corporate and state governance that they remain unfinished attempts at taming the world and that, in turn, means that there are all kinds of gaps, all kinds of opportunities for demonstrating that the suspension of confirmation can be incorporated into occurrence (Stengers, 2011). It is clear that cities now provide as never before a background on which to draw in order to make space legible in radically different ways as both prompts and processes which outrun their own systems by maximizing unforeseen implications and explications. All manner of 'flexible reconfigurations and fluid accommodations' (Dourish and Bell, 2011) may be possible based on different means of forging accompaniment. We might see such spaces of ramification as different kinds of edge structure, as the informational analogue of arrival cities, we might see them as refuges that encourage experiment, tinkering and other adaptive practices, we might see them as new ways to produce chaos out of order by inciting new conceptualities, we might see them, in sum, as alternative means of establishing sentience based on new kinds of legibility, literacy and legitimacy (Dourish and Bell, 2011), representations

that double as pathways to different waves of outstinct and to an errant sociality.

Current work on performance, on experiment (Lury and Wakeford, 2013), on new modes of collaboration which follow on from practices like the charette and the lab meeting (Rabinow, 2011), and, in general, work emanating from disciplines that see themselves as serving as caretakers for a new sociocultural ecology, is meant to move towards such a vocabulary of urban occurrence and momentary concurrence by establishing territories in which new kinds of outstinct can be fostered by fashioning operative constructs, to use a term of Guattari's, which can act as a cartographic machine (Stengers, 2011) by honing the appropriate skills. It is too soon to know if this work will succeed in producing permanent overlays in which some of these loose ends are joined up to produce new ways of cooking urban space (Morozov, 2013) but a particular characteristic of the present efflorescence of new data-rich materials – its intensely visual character – gives some hope of help to hand in the shape of new dispositions of space, light and colour.

For what we can see being put in place is a kind of correlate of the aesthetics of light and radiance of the 'Empire of Great Brightness' that characterized Ming China (Clunas, 2007). There the world was known through a succession of 'images' but this word is inadequate since, as Clunas points out, it does not grasp the way in which visuality and materiality were mixed together in objects which could move across discursive boundaries through likeness of form. None of this is to say that text was displaced. Rather, both in Ming and contemporary China, the written and the pictorial can exist in a much closer relationship based on multiple relationships of similarity. Indeed, in the elite practice of calligraphy they become a part of a series of brushstrokes which can mix up incident, anecdote and analysis in an 'ecstatic naturalism' (Mullarkey, 2006) in which content is, at the extreme, immaterial.[16]

A similar set of norms is becoming inscribed currently which depends upon a contemporary aesthetics of light and radiance which is prominent in registers as diverse as the internet and social networking, new means of programmable urban lighting, the glow of high-definition screens, and, most importantly, as a means of re-objectification with the aim of producing a continuous reel of experience based initially upon a cinematic principle but now gradually spooling into something else which is continually both recording and being recorded, so producing a set of impressions/expressions which can masquerade as a kind of continuity (Galloway, 2012). In other words, a shift is taking place which uses an increasingly large number of visual forms – with the caveat that as in China, the written and the pictorial are increasingly intertwined – to show and tell,[17] cooked into surfaces which have become materials like any other. This shift depends upon the layering of visual indexes of change in the world, each layer vivid enough to be understood not only as an expression in its own right but also as part of a constantly shifting landscape of forms.

In particular, what we can observe of the present time is an era in which forms are being rethought as journeys, as new kinds of wayshowing, as slaloms in which the hesitation of being, just off the beat, becomes an opportunity to prospect for new wake-up calls and perhaps even new ways forward into regions unknown, and in which sociality can be briefly refigured in the same way as the dissonance occasioned by the use of a semitone, so as to produce propitious moments. Cadence and tempo become important as ways of tipping practices off balance, moving them slightly out of kilter so that it is possible to peer back at them and start something opportune which exists over the border (Mitchell, 2011). New combinations produce new possibilities and so 'rouze the faculties to act', as Blake would have put it (Norvig, 1993). The effect is spiritual in that the goal is 'to render you sensitive to the passing worlds already hard upon you' (Miller, 2013: 156) in the interests of transformation and not just information. Far becomes close, other becomes neighbour, as new practices gradually find addressees (Sloterdijk, 2012).

Perhaps the best way of approaching the quick of these experiments in producing new margins to practise through a militant hesitancy is via modern art and performance. So I will point to the work of three moments in the authoring and thickening of space and the raising of spirits which are attempts to change the terms of trade by representing space in different ways which play with boundary and technology in order to create not just different kinds of cultural suspension and immersion, new bearings if you like, but new canopies under which alternative urban cultures – new we's made up of piles of unlikely ontographic juxtapositions – can be nurtured and allowed to thrive precisely because of their speculative diversity. All three exemplars of the attempt to invent such transindividual pollinations are technically sophisticated – part of the issue of the kind of art and performance I want to point to is having the technical expertise to make meaningful interventions via an acute 'sociotechnical sensibility' (Fuller and Goffey, 2013: 15) – experiments in emergence and in 'data undermining' (Munster, 2013) which use a mixture of new and old technologies to produce signposts towards alternative capacities, extra-topographical sublimes, new modes of attention and caprice. They point the way towards the powers of the 'great outdoors' by constructing artefacts – whether these be artworks or performances – that think in some

sense (Carter, 2009; Marcus, 2008; Meillasoux, 2009): objects that meditate on the nature of objects, materials that materialize in new ways. Theirs is precisely a form of divination – of finding what is not necessarily being looked for but which is seized on when it turns up as proof of a new order. The religious undertones are placed there on purpose: as I have already argued, the task is to draw out the spirits of outstinct without trampling all over them.

I want to start with the most obvious exemplar of this edging forward (Munster, 2013): artworks and performances which reflect on their own constructedness – a common enough theme. In particular, I want to point to the work of James Thiérrée. Thiérrée's work is a peripatetic mixture of live theatre, circus, dance, puppetry and vaudeville – 'strange mixtures, conversations with theater, that don't include text. I work with the unconscious a lot. Adding words would be an ego trip' (Thiérrée, 2010: 7). The work, then, has elements of all sorts of media but it cannot be reduced to any one of them. It is a melange of textures which is intent on producing effects without ascribing them to any particular medium. But it rejects film and computerized imagery in favour of found objects and outmoded theatrical machinery, thereby producing 'moving sculpture, with comic moments' as Thiérrée puts it. In what has become a classic trope, repeated all the way from War Horse to Cirque du Soleil to Olympics opening ceremonies:

> in a flying sequence near the end of the show, he has the lighting swing round to show the stage hands manipulating the flying crane, with Raoul, oblivious, doing his soaring through a night-sky bit, strapped to the other end. What the audience gets is a layered reality. By showing the mechanics, the routine is doubly interesting, yet the magic remains intact (2009).

This may seem as if it is an exercise in machinic nostalgia but I see it more as a means of interrogating the fast-cut filmic and immersive reality which is becoming dominant by showing its construction using media forms from another time. It is both a humanism that has been recast as an 'object-ism' and an attempt to produce an equivalent of a filmic slow dissolve which rejects any kind of apotheosis. In this sense, Thiérrée's work resembles that of more consciously contemporary artists, as it also does in its hunger to recast space as an errant operator and objects as a variegated array of artificial spirits with their own forms of vitality and impact.

The second exemplar is to be found in the work of that legion of artists who are using the map to inspire new forms of mapping, diagramming and wayfinding: for example, Joyce Kozloff, Julie Mehretu, Ingrid Calame, Ingo Gunther, Stephen Walter and Chris Kenny (see Abrams and Hall, 2003; Borner, 2010; Mogel and Bhagat, 2008), and all manner of performance art which uses mapping as a leitmotif, for example those works documented in O'Rourke (2013). As I have pointed out elsewhere (Thrift, 2011, 2012), maps and paramaps[18] have become a basic unit of account – a means of building infrastructure, locating and wielding influence, shaping identity and generally explicitating new lands that are then there for the taking in a densified world where continuous movement allows new forms of space to exist.

But maps and paramaps can be used in other ways too which make them into a means of questioning the world rather than just asserting it – as interrogative maps (and (m)apps) of all kinds:[19] so-called alternative mapping (Dodge et al., 2009). The renaissance of mapping is clearly correlated with the rise of Big Data, the internet and global communication more generally as so many of these pieces of map art, art which is often associated with locative developments like global positioning system or remotely sensed images (Dear et al., 2011; Kurgan, 2013; O'Rourke, 2013), show all too well. But this renaissance is also concerned with producing maps which can link performative devices at the intersection of performance, dance and video with microactions which can be attached to larger-scale conceptions and actions in seamless ways which simultaneously erode what is meant by scale. Thus, a reenergized aerial vision (Haffner, 2013) is coupled with attention to detail which is more than just focusing up or down in an energetics which both precedes and generates movement (Munster, 2013). It is a choreographic improvisation and, like all such improvisations, it is a highly skilled operation (Manning, 2013).

Such bifocal maps try to represent and simultaneously quiz a restless world of and in movement and merge with a similar renaissance in the representation of information more generally which tries to rework space, colour and indeed light (as in the work of artists like James Turrell). They can therefore also be used as an ontographic means of reworking the familiar so as to make it unfamiliar, not just renaming but reworlding all kinds of spaces by making untoward juxtapositions, from borders to landfills, from trade flows to landforms, from zones of conflict to battlefields. We are asked to 'rethink the map, the landmark we presumed we could locate, the direction we thought we knew how to follow' (Manning, 2012: 183) in order to alter our capacity to connect and relate the human and nonhuman through data which are themselves a part of that world – delegates and emissaries, figures and diagrams, mediations and representations – rather than simple

homonyms. They provide new ways of building and directing and showing and feeling outstinct.

The third exemplar is the work of Cory Arcangel. Arcangel creates works in a range of different media, including drawing, music, video, performance, as well as the video game modifications for which he is perhaps best known. He often uses the artistic strategy of appropriation, creatively re-using existing materials such as dancing stands, Photoshop gradients and YouTube videos, as well as electronic detritus like old pen plotters or turntables in order to create new works of art which find their artistic inspiration in these unlikely technological archaeologies, often by hacking their code and then rebooting them. Arcangel is five things in one. He was one of the first generation of digital hackers to enter the art world. But he also follows in a direct artistic line from the video installations of Bruce Nauman or even painted abstractions like those of Mary Heilmann or Ellsworth Kelly. His reprogrammed computer games bear the imprint of the so-called appropriation artists, like Richard Prince and Jack Goldstein. And he can be considered an heir of Andy Warhol (to whom he is often compared) in his plundering of popular culture for artistic effect. Finally, Arcangel can be seen as an archaeologist of the present, a discipline which has grown rapidly in recent years but to which Arcangel's work gives a more playful touch. These different bloodlines coalesce in works of art which are somewhere between installations creating 'instant' ambient spaces, different means of writing movement and jokes. They attempt to author space differently by twisting technology to new ends, as in Arcangel's use of the first crude 3D graphics to produce a suspension of here and now which uses what we would now probably regard as archaic techniques to write a new history of a kinetic which both lays bare the infrastructure of digitalized space and, through sophisticated hacking, attempts to produce new wayshowings (Gioni and Carrion-Murayari, 2012).

Conclusions

There can be no easy conclusions to a paper that tries to formalize something that is in formation. What I have tried to suggest is that a new world is hoving into view which cannot be encompassed by old ideas of sociality. It is a world in which new material surfaces, which mix data with objects with bodies in all kinds of ontographic combinations, are reworking what we used to call the social as a set of outstincts. It is producing new hybrid beings out of spatial registers hitherto unthought of. The interesting thing is whether we can make things more interesting and less predictable by playing with these spatial registers, or just become part of the repeat play of the security–entertainment complex. There is no general pedagogy to be had here but rather the need to build spaces that promote initiative and risk.

Can the modest experiments with space I outline in the final section of the paper conjure up alternative spirits to the steely importunate gaze of so many current urban objects and reboot sociality by initiating different outstincts? It is too early to tell. But what seems certain is that there is a pressing need for more of them in a time which is often both frantic and listless: 'And shout, shout, shout, smashed shouted shout Backward and forth across the sky . . . ' (Logue, 2001: 19). For what we need are spaces that think more than loud and ultimately empty battle cries. We need spaces that graft (Stengers, 2011). We need spaces that don't line up. We need spaces that breathe different atmospheres. We need new slopes, strips, roads, tracks, ridges, plains, seas (Logue, 2003). We need room.

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Notes

1. Though a similar kind of thinking can be found in Simondon's ruminations on the transindividual, Simondon remains at heart a humanist (LaMarre, 2013) which is why I stick with Guattari.
2. This kind of model of transmission should not be overdone. As Watts (2001) shows, very often what looks like a wildfire process of diffusion can be explained more parsimoniously as the effect of a particular item coming to the top of most-read on websites like YouTube, which implies a model of mass transmission closer to that of television.
3. Interestingly, as Bogost points out, the geographer WM Davis used this term too. In Bogost's use, the term is very close to some of Torsten Hägerstrand's thinking on so-called contextual approaches.
4. http://www.ihabilis.com/
5. In other words, it is to identify and operate on states which are not emotions, motivations, pure perceptions, sensations, at least in the strict sense, direct cognitions, nor acts through sorting and selection (Stern, 2010).
6. A word which is becoming outmoded because it means too much and too little.
7. Nor should we forget that many objects we think of as natural are just as artificial as anything that is produced in a factory.
8. This tendency can be illustrated in various ways: as the expansion of apps, for example, or as the growth of new kinds of machinically inspired sign language like Kinect.
9. A term used by Simondon to indicate that a form of thought is in operation which resists the need to choose between matter and form.

10. I use the word awareness rather than consciousness because it is much less loaded with expectations.
11. It is interesting to reflect on how various websites now routinely associate the traces of people and objects in new ways, for example, pinterest.
12. From Defoe's description of London in *A Tour Through the Whole Island of Great Britain*.
13. Think, for example, of recent anthropological work in many Latin American and African cities.
14. The idea was that the computer could fetch a graphic into memory and then only display parts of the image at a time, a procedure which was faster to load up than having to continually fetch new images.
15. Although that is by now becoming a hackneyed point: see Massumi (2009).
16. It is also worth noting that part of the Chinese tradition has been to see calligraphy as a form of communication with higher spiritual powers.
17. Hence the rise of infographics, illustrated novels, word pictures, etc.
18. I take it that just as there is paratext, so there can be paramap.
19. Perhaps some of the most interesting mapping experiments currently are with apps such as those recently produced by Bjork.

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